POWER COST STUDY;

WYOMING 9 UINTA

UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON 25, D. C.
POWER DIVISION

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SYSTEM POWER ANALYSIS

WYOMING 9 UINTA

On June 29, 1950, the Bridger Valley Electric Association, Inc. (Wyoming 9 Uinta) was granted a loan of $311,000 to install two approximately 500 kw dual-fuel diesel generating units in the cooperative's generating plant at Lyman. Now that bids have been received for this work it is apparent that the original loan of $311,000 will have to be supplemented if this construction as originally planned is to be finished.

In order that the cooperative may have sufficient funds to install the two approximately 500 kw dual-fuel diesel generating units, it will be necessary that a supplemental loan of $84,000 be made. This loan is required because of the general rise in construction costs that has been taking place since last summer.

When the allocated load of 4,312,714 is being delivered to the members from the distribution substation, it is estimated that the cost of power will be 1.40 cents per kwh. By 1961 when the load has grown to an estimated 5,150,000 kwh, the cost of power will approximate 1.36 cents per kwh.

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POWER COST STUDY

WYOMING 9 UINTA

INTRODUCTION

On June 29, 1950, the Bridger Valley Electric Association, Inc. (Wyoming 9 Uinta) was granted a loan in the amount of $660,000. Of this amount $311,000 was to be used to install two approximately 500 kw dual-fuel diesel generating units in the cooperative's generating plant at Lyman. Now that bids have been received for this work it is apparent that the original loan of $311,000 will have to be supplemented if this construction as originally planned is to be finished.

CONCLUSIONS

In order that the cooperative may have sufficient funds to install the two approximately 500 kw dual-fuel diesel generating units in its generating plant at Lyman, Wyoming, it will be necessary that a supplemental loan of $84,000 be made to the cooperative. When this $84,000 is added to the $311,000 previously loaned for this purpose, the cooperative will have invested $395,000 in these additional diesel generating facilities. When the allocated load of 4,312,714 kwh is being delivered to the members from the distribution substation, it is estimated that the cost of this power will be 1.40 cents per kwh. By 1961 when the load has grown to an estimated 5,150,000 kwh, the cost of power will be approximately 1.36 cents per kwh.

PRESENT SYSTEM

The cooperative's present power plant at Lyman, Wyoming has two relatively new 200 kw non-supercharged dual-fuel diesel generating units and four old 56 kw spark-ignited gas engines, giving a present firm capacity of 425 kw with a total installed plant capacity of 625 kw. Demand on this plant has already exceeded the firm plant capacity making it evident that it will be necessary for this cooperative to install additional capacity.

A review of the Power Cost Study on which the $311,000 loan for additional generating capacity is based shows that the following construction was contemplated. It was proposed that two new approximately 500 kw dual-fuel diesel generating units, and a new switchboard be installed at the Lyman plant and that the four old gas engines along with the old switchboard be retired. When these additions are completed the Lyman plant would have an installed capacity of 1400 kw. This installed capacity will be adequate to take care of the allocated loads. It is estimated that the salvage value of the small engines would equal the cost of removal due to the remote location of the plant. Therefore, no value is assigned to the sale of these units.

Sometime after 1955 it is recommended that the two existing 200 kw engines be supercharged. It is believed that the rating of the generating units

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could be increased to about 300 kw each at a total cost of $40,000. By making this conversion 200 kw of additional capacity could be obtained giving the cooperative enough capacity to take care of the ultimate load.

Funds in the amount of $311,000 were estimated to be required to install this approximately 1000 kw of dual-fuel diesel generating capacity in the cooperative's plant.

The cooperative has taken bids for this construction which indicates that because of the sharp increase in construction costs in the past nine months, a deficiency loan will be required. The actual contracts have been closely studied and it has been determined that $84,000 will be required to complete this previously authorized construction. Full details of this increased construction budget will be found in Appendix II of this report.

OTHER CONSIDERATIONS

Before the previous loan was made a detailed analysis comparing the cost of generated power to the cost of purchased power from the Utah Power and Light Company was made. The conclusions reached by that report was that there was no substantial economic benefit of either plan over the other. Since the cooperative preferred the entire self-generation plan the $311,000 loan for the additional generating capacity was made. The rise in construction costs would also affect the cost of transmission facilities necessary to interconnect with the Utah Power and Light Company and there would still be no substantial difference in the cost of purchased or generated energy. For this reason it is recommended that the cooperative go ahead with the construction of its generating plant.

COST OF POWER & LOAD DATA

The load data used in this study was sent to the Power Division from the A & L Division on May 7, 1951. A brief summary of the pertinent load and power cost data appears below:

	1953	1956	1961	Allocated
KWH @ SS	3,683,000	4,320,000	5,150,000	4,312,714
Cost of Power (¢/kwh)	1.74	1.57	1.36	1.40

APPENDIX I

WYOMING 9 UINTA

LOAD DATA

	1953	1956	1961	Allocated
Farm				
Members	342	350	367	342
Annual Consumption	3,400	4,000	4,700	4,200
Total Consumption	1,165,000	1,400,000	1,730,000	1,436,400
Non-Farm				
Members	284	300	320	284
Annual Consumption	2,200	2,600	3,200	2,820
Total Consumption	625,000	780,000	1,024,000	800,880
Small Commercial				
Members	135	140	145	135
Annual Consumption	9,000	9,600	10,000	9,600
Total Consumption	1,215,000	1,342,000	1,450,000	1,296,000
Street Lighting				
Members	3	3	3	3
Annual Consumption	17,000	18,000	19,000	16,800
Total Consumption	51,000	54,000	57,000	50,400
School & Churches				
Members	10	13	15	10
Annual Consumption	3,800	3,900	4,000	3,900
Total Consumption	38,000	50,700	60,000	39,000
Totals				
Members	774	806	850	774
Annual KWH	3,094,000	3,626,700	4,321,000	3,622,680
System KWH Includes (16% Dist. Losses)	3,683,000	4,320,000	5,150,000	4,312,714
Summary - Load Data				
Number of Members	774	806	850	774
KWH @ SS	3,683,000	4,320,000	5,150,000	4,312,714
Load Factor	45	47.5	50	50
Peak Demand	935	1,035	1,175	985

APPENDIX II

RECAPITULATION OF INVESTMENT

Investment prior to 6/30/50 Lyman Plant	$195,000.00
Acquisition of 2 - 50 kw diesel units (1)	1,800.16
Loan of 6/30/50	311,000.00
This Request	84,000.00
Total (Allocated & 1953 Condition)	$591,800.16
Future Investment	$ 40,000.00
Total (1956 & 1960 Conditions)	$631,800.16

(1) Wyoming 9 Uinta acquired 2 - 50 kw diesel units from Wyoming 21 Carbon for $11,945.16 and sold them to Wyoming 25 Crook for $10,145.00.

	1953	1956	1960	Allocated
System Peak Demand - KW	935	1,035	1,175	985
Present Plant Capacity - KW	625	625	625	625
This Request - KW (2)	851	851	851	851
Future - KW	-	200	200	-
Total Installed Capacity - KW	1,476	1,676	1,676	1,476
Gross Firm Capacity - KW	938	1,138	1,138	938

(2) Addition of 1,076 kw and removal of 225 kw in existing generating capacity. The low bid was for the installation of 2 - 538 kw units at the plant site.

Note:

Although there is a slight deficit of system firm capacity in comparison to the estimated system demand this situation is not considered critical because the overload capability of the units together with diversity between load areas will be able to make up this deficit.

APPENDIX II (Cont)

WYOMING 9 UINTA

REVISED CONSTRUCTION BUDGET

Addition of two 500 kw (approximately) dual-fuel diesel generating units to the Lyman Plant.

Item	Original Budget	Change	Revised Budget
1. Generating units complete with auxiliaries, installed	$ 149,000	+$51,000	$200,000
2. Building, Engine Foundation and related structures	60,000	-	60,000
3. Electrical Work	33,000	+ 30,000	63,000
4. Miscellaneous Construction	22,000	(12,000)	10,000
5. Engineering	14,000	-	14,000
6. Legal	600	-	600
7. Contingencies	6,400	-	6,400
Total	$285,000	+$69,000	$354,000
Substation			
1. Labor and Materials	$ 18,000	+$16,000	$ 34,000
2. Engineering	1,000	-	1,000
3. Contingency	2,000	(1,000)	1,000
Total	$ 21,000	$15,000	$ 36,000
Tools and Spare Parts	$ 5,000	-	$ 5,000
Grand Total	$311,000	+$84,000	$395,000

APPENDIX III

	1953	1956	1961	Allocated
KWH @ SS	3,683,000	4,320,000	5,150,000	4,312,714
KWH Gross (5% Station Use)	3,875,000	4,550,000	5,440,000	4,540,000
Annual Expenses				
Fuel @ 2.98 mills/ gross kwh (1)	$11,550	$13,600	$16,200	$13,500
Lube (60¢/gal) (1300 kwh/gal)	1,790	2,100	2,520	2,085
Maintenance Materials & Supplies	3,500	3,500	3,500	3,500
Payroll	15,000	15,000	15,000	15,000
Interest & Amortization	-	-	-	24,260
Interest & Depreciation	29,870	31,575	30,290	-
Insurance	2,000	2,000	2,000	2,000
Miscellaneous	290	225	490	155
	$64,000	$68,000	$70,000	$60,500
KWH @ SS	3,683,000	4,320,000	5,150,000	4,312,714
Cost per KWH (¢/kwh)	1.74	1.57	1.36	1.40

(1) Oil 14.5¢/gal (143,000 BTU/gal) (800 BTU/KWH gross)
Gas 18.5¢/10^6 BTU (11,700 BTU/kwh gross)